

Remarks

Claims 34 - 51 are pending. Favorable reconsideration is respectfully solicited.

The subject invention is directed to a process for rendering cured building materials such as cements, mortars, plasters, renders, etc., less subject to microbial attack (claim 43), and to curable compositions suitable for use in this process (claim 49). In many applications of curable mineral products, such as building facades and bathrooms, microbial growth under wet conditions causes discoloration, which is undesirable. In the past, as explained in the specification, biocidal actives such as the isothiazolinones, have been added to the mortar, stucco, or the like during mixing on site. Large amounts of biocidal actives are required, and even then, the degree of protection is often less than desired.

U.S. Published Application No. 2003/0018121 and Weitzel et al. U.S. Patent No. 6,740,692 ("*Weitzel*"), (*Weitzel* being the patent issuing from the published application) teach avoiding directly incorporating biocidal actives, and instead teach incorporating cyclodextrin complexes of the actives. The *Weitzel* application is discussed in the present application as WP 10105 on page 2, lines 16 and 17.

Applicants have surprisingly and unexpectedly discovered that the biocidal actives themselves may be incorporated into mineral building products at relatively low concentration and with high biocidal effectiveness if they are mixed with a redispersible polymer powder to form a redispersible polymer powder composition. The preferred method of incorporating the biocides into the redispersible polymer powder composition is to add the actives (neat biocides) to the aqueous polymer dispersion prior to spray drying, and spray drying to form the powdery composition which now has the biocide incorporated therein.¹ In the Examples and Comparative

¹ As is well known, redispersible powders are a special category of polymer powders prepared by spray drying an aqueous dispersion of polymer with a protective colloid. When added to water, redispersible powders redisperse to a dispersion with the same particle size and particle size distribution as the aqueous dispersion from which they were prepared, contrary to other powders of the same composition.

Examples, the redispersible biocide-containing compositions were much more effective than the biocide itself, even when the latter is added to the formulation in much large proportions.

For example, the renders of all the examples contained 30 parts by weight of dispersion powder. In Comparative Example 3, the dispersion powder contained no biocide and no biocide was added separately. Microbial growth was observed after 6 months and continued to increase over time. Comparative Example 4 contained 225 ppm biocide, and showed microbial growth after 9 months. In comparison, the subject invention Examples 1 and 2 incorporated the biocide into the redispersible polymer powder to form a biocide-containing redispersible polymer powder composition. When added at 30 parts of redispersible powder to the render as in the other examples, the renders respectively contained 22.5 ppm and 10.5 ppm of the biocide active, *i.e.* one tenth and one twentieth the amount of Comparative Example 4. Despite containing this extremely small amount of biocide, the render showed no microbial growth after 12 months, *i.e.* one twentieth (0.05) of biocide was more effective than twenty times this amount, a truly surprising and unexpected result. This result is confirmed with several different redispersible polymer powders in the first Declaration of Dr. Weitzel, which is already of record.

The claims have been amended to recite that the redispersible polymer powder composition consists of the enumerated ingredients, these being the polymer itself, the biocide active, emulsifiers (page 8), protective colloids (pages 7 - 8), antifoams (page 9), anti-blocking agents (page 9), and hydrophobicizing agents (page 10). Thus, the redispersible polymer powder composition cannot contain any cyclodextrin, due to the closed "consisting of" language used prefatory to the ingredients of the biocide component.

Claims 49, 34 - 43, and 47 have been rejected under 35 U.S.C. § 102(b) as anticipated by Weitzel U.S. Published Application No. 2003/0018121. This application has been granted as Weitzel et al. U.S. Patent No. 6,740,692 ("*Weitzel*") and in the discussion which follows, reference will be made to the patent, not the published application, since the disclosures are identical.

The claims and specification are interpreted by one skilled in the art. During examination, the claims are given their broadest reasonable interpretation, but the emphasis here is on "reasonable." The Courts have held that with respect to what is reasonable, "claim language must be read in light of the specification as it would be interpreted by one of ordinary skill in the art," *In re Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990), citing *In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 2d 385, 388 (Fed. Cir. 1983). See also *In re Suitco Surface, Inc.*, Slip Opinion 2009 - 1418 (Reexamination No. 90/007,015) (Fed. Cir. April 14, 2010).

Claim 49 is presented below:

49. A curable mineral construction product comprising a water-redispersible polymer powder composition, said redispersible polymer powder composition consisting of a water-redispersible polymer powder and at least one biocidal additive selected from the group consisting of bactericide active(s), fungicide active(s), and algicide active(s), the biocidal additive being present in the water redispersible polymer powder composition in an amount of 0.001 to 0.5 percent by weight based on the weight of the water redispersible polymer powder composition, and wherein the water redispersible polymer powder composition optionally contains one or more of emulsifiers, protective colloids, antifoams, antiblocking agents, and hydrophobicizing agents.

The clear claim language requires the biocidal additive to be "selected from the group consisting of bactericide active(s), fungicide active(s), and algicide active(s)." The terms "active" or "active compound" are words of art in the biocide field which pertain to the biocidal compound itself, *i.e.* neat. A composition containing 50% filler and 50% biocide is not an "active". It contains only 50% actives, *i.e.* 50% of biocide.

Weitzel is directed to the goals of incorporating biocides and photoinitiators into mineral building products to prevent soiling. *Weitzel* discloses that prior art methods of direct incorporation are not desirable, and proposes to avoid these problems by addition of the "active",

i.e. the photoinitiator compound or biocide compound, into the building product in the form of a cyclodextrin complex. See Table 1 for the composition used in the Examples. Note, in particular, Example 6, which used a cyclodextrin complex of n-octylisothiazolinone ("OIT") which is also used in Applicants' examples. In Comparative Example C8, uncomplexed OIT was added directly to the building product composition by mixing. At the same concentration of active (0.1% = 1000 ppm), after 15 months of weathering, the soiling of the cured coating was less using the cyclodextrin complex than when the active was used alone. Similar results were achieved in Example 9 and Comparative Example C10, using a different biocide, complexed within cyclodextrin in Example 9, and added neat in Example C10.

The position of the Office is that the term "biocidal active" and like terms: "bactericide active(s)", "fungicide active(s)", and "algicide active(s)" would include the cyclodextrin/biocide complexes of *Weitzel*. However, such an interpretation is not only contrary to how one skilled in the field of biocides views this term, but is also contrary to how one skilled in the art would interpret this term in light of the specification, per *Bond*, *Sneed*, and *Suitco*. Any such interpretation is unreasonable. One need only to go to their local hardware store, Lowes, or Home Depot, and observe the label of any biocidal or herbicidal product. One will find listed "Active Ingredients," following which will be listed the biocidal actives, generally in small amounts, followed by "inert ingredients", which include water, solvent, emulsifiers, stabilizers, complexing agents, etc. One would never say that a bottle of Weed-B-Gon® is an "active." It contains only a very small amount of actives, less than 1%. The same reasoning applies to cyclodextrin complexes of actives. The complex itself is not the active. The active is what is complexed within the cyclodextrin. This is how one skilled in the art views the term "biocidal active." The claims indicate that the biocidal; active "consists of" bacteriocidal, fungicidal, or algaecidal actives. "Consists of" is a closed phrase which prohibits inclusion of other substances. Thus it is clear that the claims do not include biocide cyclodextrin complexes as the presence of cyclodextrin is precluded by the "consists of" language.

Dr. Weitzel, in his first Declaration, testified that one skilled in the art would not view the cyclodextrin biocide complexes as biocidal actives. Dr. Weitzel is a highly experienced

scientist with great knowledge in the fields of redispersible polymers and building materials employing them, including soiling caused by microbial growth and the use of biocidal actives. Dr. Weitzel is certainly familiar with his prior patent, which is discussed on page 2 of the specification. The *Weitzel* Declaration is supplemented by a second Declaration enclosed herewith. Dr. Weitzel again emphasizes that the cyclodextrin biocide complexes as disclosed in *Weitzel* are not biocidal actives. They contain biocidal actives, but are not themselves biocidal actives. This understanding of the term "actives" or "biocidal actives" or like terms is not only supported by Dr. Weitzel, a highly skilled and experienced artisan in the field, but also comports with common usage, usage which is so well recognized that judicial notice may be taken thereof. The claims do not allow such compositions within the scope of the term "polymer powder composition" due to the closed "consisting of" transitional phrase. It is further noted that the term "consisting of" with regard to the biocidal additives trumps the broader, open "comprising" language in the claim preamble, as indicated by the MPEP and well recognized in U.S. patent law. An inner transitional phrase "consisting of" (or "consisting essentially of") restricts the named component to the ingredients specified, regardless of whether "comprising" occurs in the preamble or in other portions of the claim. Thus, the redispersible polymer powder composition does not include cyclodextrin or cyclodextrin complexes. A composition "comprising" an alcohol selected from the group "consisting of" methanol and butanol does not include ethanol, for example.

Moreover, the claim terms must be read by one skilled in the art in light of the specification. The *Weitzel* application is referenced as prior art on page 2 of the application: "WP 10105 discloses coating compositions containing fungicides as complexes with cyclodextrin." One skilled in the art, reading the specification and recognizing that the Applicants cited biocide cyclodextrin complexes as prior art would never construe the claims to include such complexes. That is not a reasonable interpretation of the specification.

Weitzel teaches against using uncomplexed biocides, and discloses no biocide-containing polymer powder composition at all, even one containing cyclodextrin complexed biocides. *Weitzel* never discloses mixing of any biocidal additive, whether the active alone, or

as a cyclodextrin complex of the active, with the redispersible polymer powder to produce a water redispersible polymer powder composition. The only mixing disclosed may be found at column 7, line 66 to column 8, line 10, but here, no redispersible polymer powder composition containing biocide is disclosed. Instead, all the ingredients, separately, are added to the coating formulation, *i.e.* mixed at the construction site.

A rejection for lack of novelty under 35 U.S.C. § 102(b) requires strict identity. See, *e.g. Trintec Industries, Inc. v. TOP - U.S.A. Corp.*, 295 F.3d 1292 (Fed. Cir. 2002). Here, there is no such strict identity. Not only does *Weitzel* not disclose the preparation and/or use of any water redispersible polymer powder composition containing neat biocide, he also does not disclose any mixture of a redispersible polymer powder with even his cyclodextrin complexed biocides.

Reversal of the rejection of the claims under 35 U.S.C. § 102(b) over *Weitzel* is respectfully requested.

Claim 50 has been rejected under 35 U.S.C. § 103(a) over *Weitzel*.

Claim 50 is dependent from claim 49, and reads as follows:

The curable mineral construction product of claim 49, wherein the polymer of the redispersible polymer powder is a vinyl acetate, vinyl versatate and ethylene copolymer, and the biocide is a solid biocide consisting of N-octylisothiazolinone.

Weitzel discloses the use of N-octylisothiazolinone (Example 6, Comparative Example 8), which is a solid, but teaches that the biocide must be complexed with cyclodextrin, thus teaching away from uncomplexed biocides. Claim 49 from which claim 50 depends, requires the biocidal additive to be selected from the group consisting of bacteriocidal, fungicidal, and algaecidal actives. A cyclodextrin complex of an active is not an active. It

contains an inactive ingredient, cyclodextrin, which is not permitted by the "consisting of" language of the Markush group. *Weitzel* teaches away from the use of non-complexed additives, contrasting the use of cyclodextrin biocide complexes with neat biocides in their comparative examples. At column 7, lines 5 - 7, *Weitzel* indicates that "[i]n the coating compositions of the invention, the photoinitiator b) and/or fungicide b) are each present in the form of a cyclodextrin complex." *Weitzel* teaches away. Teaching away is strong evidence of non-obviousness. *W.L. Gore v. Garlock*, 721 F.2d 1540 (Fed. Cir. 1983).

Withdrawal of the rejection of claim 50 under 35 U.S.C. § 103(a) is respectfully solicited.

Claims 34, 44 - 46, 48 and 51 have been rejected under 35 U.S.C. § 103(a) over *Weitzel* in view of *Botts* U.S. Patent 7,070,795 ("*Botts*"). Applicants respectfully traverse this rejection.

The teachings of *Weitzel* have been discussed previously. *Weitzel*, to the extent it is related to use of biocides, requires the biocides to be in the form of a cyclodextrin complex.

Botts requires the agricultural active ingredients (note the use of the term "active" by *Botts*, consistent with Applicants use of this term) entrapped in a polymer matrix. After being so entrapped, the biocide can only be released by slow diffusion through the polymer matrix. In *Weitzel*, the biocide is simply released by exiting the cyclodextrin host cavity. Diffusion is not relevant. The modes of operation are totally different.

It is impossible to reconcile *Botts*' teachings with those of *Weitzel*. In the sections of *Botts* cited by the Office, *Botts* teaches preparation of compositions which contain a biocide uniformly distributed within a polymer matrix. These are not CD complexes, nor are they in any way similar to Applicants' redispersible polymer compositions. Moreover, the spray drying technique of *Botts* and that of Applicants are very different. *Botts* teaches dissolving polymer and biocide in hydrophobic organic solvent to form a solution, emulsifying the solution into

droplets in an aqueous or hydrophilic phase, and then spray drying. As a result, polymer beads containing biocide uniformly dispersed therein are formed. This is not Applicants' process, nor can the process of *Botts* form any redispersible polymer powder composition.

In Applicants' process, a dispersion of solid polymer particles and biocide are spray dried. See Examples 1 and 2. Because the polymer is in solid form already, the biocide cannot be uniformly dispersed within the particles. Moreover, the polymer particles of *Botts*, by definition, are not redispersible. To be a redispersible polymer powder, the polymer must exist in solid particulate form prior to spray drying, as is well known. In the *Botts* process, the polymer is not in solid form, but in dissolved form. Thus, no redispersible polymer composition can be produced. Note that *Botts* does not employ any protective colloid, necessary to form a redispersible polymer powder.

Even if *Botts* taught a redispersible polymer composition, which he does not, there would be no motivation to combine *Botts* with *Weitzel*, because *Weitzel* teaches cyclodextrin biocide complexes, not biocides uniformly dispersed in polymer beads. These contrasting teachings cannot be reconciled. Reversal of the rejection of the claims over *Weitzel* in view of *Botts* is respectfully solicited.

It is correct that claim 47 only requires "mixing." However, it requires mixing of the biocide with a redispersible polymer powder, a less preferred embodiment of the present invention. Mixing cannot incorporate the biocide into the polymer matrix of the redispersible polymer powder, as required by *Botts*, and a redispersible polymer powder is in the form of solid particles, by definition, both prior to and after spray drying or mixing.

Claim 48, dependent on claim 47, requires that the aqueous polymer dispersion and the biocide are spray dried. A dispersion, by definition, is composed of a solid, dispersed phase, here, the solid polymer particles and solid biocide particles. If the polymer were a liquid, it would be in the form of an emulsion, not a dispersion. Moreover, an emulsion of liquid polymer cannot be spray dried to form a water redispersible polymer, by definition. "Spray

drying" of an emulsion of liquid particles would remove the continuous phase, creating a liquid polymer, not a polymer powder, and certainly not a redispersible polymer powder. The Examiner treats these limitations as not being in the claims, but they are. The term "redispersible polymer powder" ("RDP") is a term of art which is well known. Redispersible polymer powders have been available on the market since the 1950's at least, and consist of solid polymer particles protected from coalescence (film formation) by the presence of a protective colloid. RDPs are formed by drying, preferably spray drying, an aqueous dispersion of solid polymer particles of very fine size produced by emulsion polymerization. During emulsion polymerization, the liquid monomers are converted to solid polymer particles by polymerization, as is well known, and which has been practiced for decades. The dispersion of solid particles which results is dried in the presence of a protective colloid to form the RDP, which can then be redispersed in water by simple stirring to produce a dispersion having the same particle size and particle size distribution as the particles in the aqueous dispersion had prior to drying. These characteristics of RDPs have been known for decades, and are so well known that judicial notice may be taken thereof.

The process of *Botts* spray dries a solution of solid polymer, not a dispersion, and because the biocide is also dissolved in the organic solvent, spray drying, which removes the solvent, produces polymer particles having biocide dispersed, usually dissolved, in the polymer matrix.² This cannot be done in Applicants' process because the polymer is already in the form of solid particles in the aqueous dispersion prior to spray drying, and there is no organic solvent. *Botts* teaches away from the claimed invention. The redispersible polymer powder composition of Applicants, when added to water (for example in the preparation of a mortar, stucco, or architectural coating), will produce a dispersion of polymer particles and biocide particles, not a dispersion of polymer particles having a biocide uniformly distributed within a polymer matrix as required by *Botts*.

² Prior to spray drying, polymer particles did not exist: only polymer in solution in solvent. No protective colloid or emulsifier, necessary to form an RDP is used. The solid particles are not RDPs.

The Office appears to believe that *Botts* teaches a water redispersible polymer powder, and states, with regards to Applicants' claims, that

[t]he claim merely recites a process of spray drying a biocide and an "aqueous polymer dispersion" and does not require that the polymer is in a particular state, *i.e.* dissolved as taught by *Botts* or in solid form. That is, "aqueous polymer dispersion" encompasses both dissolved polymer in solution and a solid polymer in water, as long as the polymer is "dispersed" with the aqueous liquid. Thus, claims 34 and 44 do not require that the redispersible polymer powder is in solid form but rather that the polymer is dispersed or dissolved in water.

This is absolutely incorrect. An aqueous polymer dispersion is, by definition, a dispersion of solid polymer in an aqueous phase. A solution is not a dispersion. A solution of a polymer cannot form a redispersible polymer powder, as so well known in the art as to require judicial notice thereof, and as attested to by Dr. Weitzel, who has simply enormous experience in this field, as indicated by the number of patents and patent applications directed to this field. *Botts* discloses no redispersible polymer powder composition, and his polymer solutions are incapable of forming one. Withdrawal of the rejection of claims 34, 44 - 46, 48 and 51 under 35 U.S.C. § 103(a) over *Weitzel* in view of *Botts* is respectfully solicited.

In Dr. Weitzel's second Declaration, he further comments on the art recognized meaning of biocidal actives. Due to Dr. Weitzel's great experience, this evidence must be given great weight. Dr. Weitzel also testifies to the meaning of redispersible polymer powder, for which testimony he is well qualified, as indicated by the printout of the many patent families in which he is an inventor. Most of these patent families were filed multiply in various countries or regions around the world.

Dr. Weitzel indicates that RDPs cannot be prepared from polymer solutions, as is well known, and describes the unique aspects of RDPs. Dr. Weitzel also refers to the *Schulze* article from TIZ which illustrates the formation and redispersion of redispersible polymer

powders, and the differences between these highly redispersible powders and conventional polymer powders. Reference may also be made to the article on Dry Mortars from ULLMAN'S, cited by Dr. Weitzel. Dr. Weitzel further indicates that the process of *Botts* does not result in the formation of redispersible polymer powders.

Claims 49, 34 - 35, and 37 - 46 have been rejected for obviousness-type double patenting over *Weitzel*. For the reasons discussed previously with regard to *Weitzel* and *Weitzel*, this rejection is untenable.

Weitzel requires that the biocide be incorporated in a cyclodextrin complex and makes no mention of a biocide-containing redispersible polymer powder composition. One could practice the invention of *Weitzel* without infringing the claims of the present application, and *vice versa*. The two applications/patents are mutually distinct.

Weitzel does not teach or suggest the claimed invention, but teaches away. *Weitzel* teaches against the use of uncomplexed biocides, and requires that his fungicides be present in the form of a biocide/cyclodextrin complex. In Applicants' invention, the biocides are not complexed, but are supplied in the form of the neat actives themselves to the redispersible polymer powder composition. *Weitzel* teaches against such use.

The allowance of the claims of the present application would not extend the life of the *Weitzel* patent because the claimed subject matter of *Weitzel* is distinct from the claimed subject matter of the present application. Moreover, the claimed subject matter is not rendered obvious by *Weitzel* under 35 U.S.C. § 103(a) because *Weitzel* teaches away from the claimed subject matter by requiring cyclodextrin complexed actives rather than the actives *per se*. *Weitzel* does not teach or suggest preparing a composition containing a water redispersible polymer powder and an uncomplexed cyclodextrin, and in fact does not even teach the preparation of a water redispersible composition containing a redispersible polymer powder and his cyclodextrin complexed cyclodextrin.

Withdrawal of the obviousness-type double patenting rejection over *Weitzel* is respectfully solicited.

Claims 49, 33 - 35, and 37 - 46 have been rejected under 35 U.S.C. § 103(a) over *Weitzel*. Applicants respectfully traverse this rejection.

These claims are clearly non-obvious over *Weitzel*, and the arguments set forth previously herein are repeated. *Weitzel* teaches against the use of uncomplexed biocides.

The recitations in paragraph 11 on pages 11 - 12 of the Office Action are not understood, as no ground of rejection appears to be set forth. As indicated previously, *Weitzel* does not render the claimed invention obvious, and one could practice each patent irrespective of the other.

The recitations in paragraph 12 are also not understood, these references to "Paragraph 15 above", but there is no paragraph 15 above.

Withdrawal of all rejections of record is respectfully requested.

Applicants submit that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, the Examiner is highly encouraged to telephone Applicants' attorney at the number given below.

S/N: 10/596,266
Reply to Office Action of July 19, 2010


Atty Dkt No. WAS 0768 PUSA

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Respectfully submitted,

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